BUILDINGS ENVIRONMENTAL IMPACT ASSESSMENT

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ABSTRACT

To study the construction as modifying of the environment and by so much as aesthetic attribute of the scene should know in what aspect influences. The physical resources of the landscape will be very seemed before and after the incorporation of a project (quality of content). Therefore they will be mainly the new composition of the elements (communicative quality) and the aesthetic resources (quality aesthetics) on those which will influence the constructions. The different points of view election will remain settled with the simulation by infographic photocomposition.

The visual and aesthetic aspect of any object is defined by their characteristic of color. form. line and texture. It could be also added any elements of compositive reference as are its scale and being tried to stages. as is the case of the landscape. its spatial character.

In this article we will center ourselves in one of these attributes: the texture. The different textures vision is crucial in the communication.

The simulation of the landscape has suffered a great impulse with the treatment of the photograph. This method admits various alternatives. It can be analyzed the taken image of the reality such which. or deducting some of its parts. adding some other element originating from the same or of other scene. or including constructions designed in CAD.

The great advance. for the investigation of the visual perception. is procured in the composition using the landscape as fund and a construction created through a design program attended by ordering. This step supposes great alternatives variability and a rapid generation of the same. Settled the great problem to obtain to compatibilize the points of view of the panorama and of the superposed performance and eliminated by photographic treatment the properties of the surfaces that tend to be smooth and metalized brilliants. as occurs in the infography three-dimensional. the analysis and results are enlightening. The reflections and conclusions on the texture emerge with speed. They are analyzed in the study the different simulations with different textures.

Key Words : Environmental Impact. buildings. infographic modeling. texture.

INTRODUCTION

Landscape is visually impacted by the buildings that are scattered through it. Rural buildings. due to their location and dimensions have a considerable influence on the aesthetic perception of landscape. In Spain. landscape is an increasingly important natural resource and. therefore. buildings constitute a relevant factor in landscape quality. as they are elements that intervene in the conservation of ecosystems. which are one of the main economical resources in many Spanish regions.

The need to preserve and improve landscape is based on the human appreciation of it. The appreciation of landscape as something worthy is being included as an environmental factor which

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conditions the location and design of buildings. Rural problems are mainly development ones, not only economical but also in terms of life standard. The social challenge is settled in order to get solutions that would improve that standard and obtain adequate indicators to measure it.

Buildings are one of the main factors that modify landscape and the rural environment. They are agents that affect the state of the ecosystem; they are elements that have an influence on their value.

ENVIRONMENTAL CONSIDERATIONS AND PLANNING

To analyze the modification in landscape value, it is necessary to consider landscape in a broad manner, which needs of very different kinds of studies. Therefore, it is needed to accept the varied meanings of the term and treat it with flexibility. There are two main aspects when dealing with landscape:

- Total landscape: which identifies the landscape and the environment it may contain.
- Visual landscape: it considers mostly aesthetics and perception.

It is this second aspect with which this paper will deal with, covering only the observed area when inside the territory, and not the whole of the territory, as in the first definition occurs.

The area that is the subject of study is defined by the observer's perception and, though all senses intervene, mainly by its vision. This delimitation has been chosen because the analysis of a visual environment around a point or a number of points, constitutes a very adequate system to examine a projected intervention on the territory and thus allows helping adjust its location and design.

Usually the constructions imply a suppression of natural surfaces, introducing foreign elements to the area. This inclusion of "foreign elements" makes mandatory its planning and a study of the design criteria of constructions in the landscape.

It is thus necessary an adequate planning that anticipates environmental problems and avoids incompatibility between conservation and development; when both concepts get integrated, an indefinite benefit is obtained for the human community.

Landscape should be one of the main resources to protect from negative aesthetic pollution. New computer modeling technologies offer tools for landscape visual impact study.

VISUAL PERCEPTION OF LANDSCAPE AND BUILDINGS: TEXTURE

In order to study the buildings as modifying elements of the environment and therefore as aesthetic properties of the scene, we must know in what sense it has an influence over visual landscape. Landscape physical resources will be similar before and after including a building (quality of content), so the inclusion of buildings will mainly affect the new composition (communicative quality) and the aesthetic resources (quality aesthetics).

Its color, shape, line, and texture define the visual and esthetical features of any object. Other elements of compositive reference may be added, such as the scale and the spatial character (when dealing with scenarios, as in the case of landscape).

In this paper we will only deal with one of these attributes: texture. A joint vision of the different textures is crucial for the communication between the observer and what is observed. For example, the texture of an old fence or the one of a rock covered with lichen may become the focal point of a given landscape. In the case of buildings, the texture of walls and roofs is fundamental regarding the visual perception of the scene. Amongst the authors that have studied the parameters that have influence on the integration and have considered as relevant the texture of materials, we consider remarkable the following: Penfold (1979), O'Farrell, F. (1987), Cull (1987), Di Facio, J. (1989), and Cañas, I. (1992).

Different definitions of texture exist according to the criteria considered:

* As an attribute of an object: it is the disposition that the microscopic constituents of a body or fabric adopt. It is a generic definition that affects more the material itself than its aspect.
* As an optical property: it is the visual effect of the relation between light and shadow, caused by

the variations that exist over the surface of an object. Texture is formed by the way the object reflects light. glossy or dull surfaces.

* As an attribute of a scene: it is the aggregation of small forms or color mixtures that constitute a continuous model of a surface. In the scenic composition each of these parts is integrated in a surface. The texture depends on the distance. Therefore, we may distinguish between infrastructure (e.g., roughness of a brick), texture (disposition of the bricks in a wall), and suprastructure (the whole of the walls in a town). If we observe a town from the distance we will not be able to distinguish separate bricks from the walls, since the mass will be perceived as a surface composed by the visible walls of the different buildings.

Texture is generally characterized by:

- Regularity (in groups, ordered, chaotic): degree of order and homogeneity regarding the spatial distribution of surface irregularities.
- Density (disperse, medium, dense): space between surface variations.
- Internal contrast (low contrast, high contrast): diversity of colors and luminosity in the surface.
- Grain (fine, medium, coarse): relative dimension of surface irregularities

A texture can thus be glossy or dull, can be considered as an infrastructure, a texture or a supratexture, and besides have a grain value, density, regularity, and internal contrast.

According to perception psychology (Mayor, 1985) the psychic design of each particular kind (sensitive systems, motivations, social tendencies....) have an influence on the selection of the informative properties that will be processed. Due to the wide range and resolution of the visual device of humans there is a discrimination of lots of properties (colors, textures, etc.), ans that also recognize a wide variety of objects from a broad range of magnitude scales.

The physical environment includes significant sensitive properties: for example, in the visual environment surfaces, textures, colors, shapes, sizes... are processed. To face environmental irregularities an efficient representing device is required. No doubt that humans possess that most advanced representative capacity, that provides a very wide cognitive horizon.

There is a first control mechanism, which is the information selection, so that not every data is processed, but only those that are considered pertinent or dominant. A second strategy consists in the automatization of a process or task. It constitutes a great saving of cognitive resources. An automatic process consumes no attention, does not require any effort, does not interfere with other simultaneous activities.

Selection and automatic process are strategies to reduce information and to optimize resources. The mental representation of the environment considers these principles.

Finally, these human information process principles, contrasted by empirical research, and therefore not just the result of free speculation, show that when making a mental representation of the environment an automatization and selection of relevant data is performed, there a development of prototypes, and there is a considerable influence from formerly stored data.

Coarse textures with a high internal contrast are visually predominant over fine textures with a low internal contrast. It is thus very important to know the types and subtypes of textures of materials in order to study the aesthetics of a scene and to analyze the environmental impact and the integration in the surroundings. The different landscape valuation methods (e.g., Cañas Guerrero, I., 1992) consider a high texture diversity as a factor that increases its value, and the co-existence of dull and glossy surfaces yields a positive element such as contrast.

MODELING AS A WORK TOOL

Landscape modeling has suffered great advance with photograph treatment. This method admits diverse alternatives. The image taken from reality can be examined without any treatment, or some parts can be subtracted or added, or CAD (Computer Aided Design) elements, such as buildings, can be included in the picture.

The great advance for visual perception research comes from composition, using the original landscape as wallpaper in which a CAD building is introduced.

CAD software is having nowadays wider application in modeling. These programs allow the introduction of volumetric and tridimensional information which, once integrated allows representing the element from any point of view defined by the operator.

These modeling applications have graphical tools that include light and shadow, but even more spectacular is its dynamical character. Graphic designs tend to give a precise and solid perception of objects, with a representation of surfaces (color and texture) that is not natural.

The roughness of textures tends to be interpreted as marbled surfaces with some brightness or color change, while natural shapes are simplified as pure geometric shapes.

The advance in modeling tools allows the evaluation of a great number of alternatives and a quick generation of these. Once the problem of compatibilizing panoramic points of view with superposed performance is overpassed, it is needed to eliminate, with the adequate photo treatment, those image attributes that tend to be shiny, polished or metalized (as happens in tridimensional infography). Image treatment techniques (bidimensional infography) add the visual information of the image as a huge database of the small point of which it is formed (pixels). Image definition relies on the density of spots with which it is represented.

Photograph treatment used as a landscape modeling technique has the same problems as artistic drawings, but with the advantage of giving a more realistic effect. They are static models, so to globally illustrate a given landscape several images may be needed.

The analysis and results are clarifying when this hybrid technique is used, between 3D design and its integration in a 2D environment. The communication between the two gives a series of models with different textures and environments.

This technique allows studying the relationship between landscape composition structure and the aesthetic features of the introduced objects, in order to determine what alterations it may produce. Design variables, in particular texture, may be modified to force contrasts or eliminate them, change the relative importance of aesthetic elements or substitute them, etc.

It must be noticed that decision making regarding the development of a certain project should come from the study of the relation between the environment and the building. This does not imply a total absence of environmental impacts. Each professional has certain objectives and different motivations. A total camouflage of the building may be pursued, or to stick it out due to advertisement, integrate it in the composition, or other. This modeling technique is an ideal tool for analysis and diagnose.

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